Air Quality Permitting
Statement of Basis

September 27, 2007

Permit to Construct No. P-2007.0100

High Desert Milk, Inc., Burley

Facility ID No. 031-00034

Prepared by:

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Air Quality Division

PROPOSED

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Acronyms, Units, and Chemical Nomenclatures

AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
Btu	British thermal unit
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
gr	grain (1 lb = 7,000 grains)
hp	horsepower
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
lb/hr	pound per hour
MMBtu	million British thermal units
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
scf	standard cubic feet
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	synthetic minor
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct.

2. FACILITY DESCRIPTION

The facility will produce sweet cream, skim milk, and dry milk from raw milk. The facility will process 2.5 million pounds of milk per day.

3. FACILITY / AREA CLASSIFICATION

High Desert Milk, Inc. is classified as a synthetic minor facility because High Desert Milk's potential to emit is limited to less than major source thresholds. The AIRS classification is "SM80".

The facility is located within AQCR 63 and UTM zone 12. The facility is located in Cassia County which is designated as unclassifiable/attainment for all regulated criteria pollutants (PM_{10}, CO, NO_X, SO_2, lead, and ozone).

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at High Desert Milk, Inc. This required information is entered into the EPA AIRs database.

4. APPLICATION SCOPE

This application is an initial Permit to Construct (PTC) for construction and operation of a new milk processing facility.

4.1 Application Chronology

June 18, 2007	DEQ received PTC application and application fee
June 22, 2007	DEQ requested and received supplemental information for the Emergency Generator
July 3, 2007	DEQ approved 15-day pre-permit to construct.
July 18, 2007	DEQ determined the application complete
August 13, 2007	DEQ received supplemental emissions information regarding the diesel generator and revised emissions inventory

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action.:

5.1 Equipment Listing

Table 5.1 SUMMARY OF REGULATED SOURCES

Source Description	Emissions Controls
Skim Milk Dryer Emissions Unit Name: Skim Milk Dryer (P101) Manufacturer: Dryer: C/E/Rogers Burner: Maxon Model: Crossfire Low NO_x Line Burner Max Capacity: 32.5 MMBtu/hr Operation: 8,760 hrs/yr	Baghouses (P101A & P101B)
Natural Gas Boilers Emissions Unit Name: Boiler No. 1 (P104) Max Capacity: 62.77 MMBtu/hr Fuel: Natural Gas Operation: 8, 760 hrs/yr Emissions Unit name: Boiler No. 2 (P105) Max Capacity: 62.77 MMBtu/hr Fuel: Natural Gas Operation: 8,760 hrs/yr	None
Fluid-bed and Powder Handling - Fluid-bed Manufacturer: C/E/Rogers Max Capacity: 9,000 lb/hr - Powder Handling Manufacturer: C/E/Rogers	- Fluid-bed Baghouse (P102) Manufacturer: C/E/Rogers Model: Fluid-bed Baghouse Control Efficiency: PM/PM_{10}: 99.93% - Powder Handling Baghouse (P103A & P103B) Manufacturer: C/E/Rogers Model: Powder Handling Baghouse Control Efficiency: PM/PM_{10}: 98.4 %
Emergency Generator Manufacturer: Cummins Max Capacity: 755 HP Max Operation: 500 hrs/yr Displacement: 2.5 liters/cylinder Ignition: Compression	None

5.2 Emissions Inventory

Table 5.2 HIGH DESERT MILK, INC. EMISSIONS INVENTORY

Emissions Unit	PM_{10}		SO_2		NO_x		CO		VOC	
	lb/hr	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Milk Dryer	10.6	46.2	0.0	0.1	1.5	6.4	11.9	52.2	0.18	0.8
Fluid-bed	1.1	4.7								
Powder Storage	0.1	0.5								
Boiler No. 1	0.5	2	0.0	0.2	6.2	27	5.2	22.6	0.3	1.5
Boiler No. 2	0.5	2	0.0	0.2	6.2	27	5.2	22.6	0.3	1.5
Emergency Generator[1,2]	0.2	0.1	0.3	0.1	8.0	2.0	4.3	1.1		
Total		55.5		0.5		62.4		98.5		3.8

[1] The emission rate for SO_x from the emergency generator was calculated using an emission factor from AP-42 chapter 3.4 "Large Stationary Diesel and All Stationary Dual-Fuel Engines" assuming a fuel sulfur content of 500 ppm (0.05%). Emission rates for all other pollutants based on manufacturer's specifications for QSX15-G9 Nonroad 2 engine with faceplate rating of 755 HP. Emergency generator ton/yr values estimated based on 500 hours of operation.

[2] NO_x emissions for the emergency generator include oxides of nitrogen and total unburned hydrocarbons.

5.3 Modeling

Air dispersion modeling results demonstrate compliance with all applicable standards. Modeling demonstrates that the facility will have the capacity to operate with PM_{10} emissions at 95% of the 24-hour NAAQS standard and 94% of the annual NAAQS standard. Details of the ambient impact analysis, including predicted ambient concentrations may be seen in Appendix C (Modeling is currently under review).

5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201.....Permit to Construct Required

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

IDAPA 58.01.01.203.....Permit Requirements for New and Modified Stationary Sources

The applicant has shown to the satisfaction of DEQ that the facility will comply with all applicable emissions standards, ambient air quality standards, and toxic increments.

IDAPA 58.01.01.210.....Demonstration of Preconstruction Compliance with Toxic Standards

The applicant has demonstrated preconstruction compliance for all TAPs identified in the permit application.

40 CFR 60, Subpart Dc .....Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

40 CFR 60.40c .....Applicability and delegation of authority.

High Desert Milk, Inc. is subject to 40 CFR 60, Subpart Dc because they are the owner and operator of two small industrial-commercial-institutional steam generating units that been constructed after June 9, 1989 and have a design heat input capacity of 100 MMBtu/hr or less but greater than 10 MMBtu/hr (62.77 MMBtu/hr each) in accordance with 40 CFR 60.40c(a).

40 CFR 60.41c .....Definitions

All parts of this section apply to the requirements of 40 CFR 60, Subpart Dc.

40 CFR 60.42c .....Standards for sulfur dioxide (SO_2)

The facilities 62.77 MMBtu/hr boilers combust natural gas, natural gas is not identified in this section as a regulated fuel subject to SO_2 standards.

40 CFR 60.43c .....Standards for particulate matter (PM)

The facilities 62.77 MMBtu/hr boilers combust natural gas, natural gas is not identified in this section as a regulated fuel subject to PM standards.

40 CFR 60.44c .....Compliance and performance test methods and procedures for sulfur dioxide.

The facilities 62.77 MMBtu/hr boilers combust natural gas, natural gas is not identified in this section as a regulated fuel subject to SO_2 standards.

40 CFR 60.45c .....Compliance and performance test methods and procedures for particulate matter

The facilities 62.77 MMBtu/hr boilers combust natural gas, natural gas is not identified in this section as a regulated fuel subject to PM standards.

40 CFR 60.46c .....Emission monitoring for sulfur dioxide

The facilities 62.77 MMBtu/hr boilers combust natural gas, natural gas is not identified in this section as a regulated fuel subject to SO_2 standards.

40 CFR 60.47c .....Emission monitoring for particulate matter

The facilities 62.77 MMBtu/hr boilers combust natural gas, natural gas is not identified in this section as a regulated fuel subject to PM standards.

40 CFR 60.48c .....Reporting and recordkeeping requirement

The facilities 62.77 MMBtu/hr boilers combust natural gas, natural gas is considered "fuel not subject to emissions standards" and this subpart does not identify an opacity standard for natural gas therefore an opacity standard for this subpart does not apply. The facility must record and maintain records of the amount of each fuel combusted during each calendar month in accordance with 40 CFR 60.48c(g)(2).

All records required under this section shall be maintained by the owner or operator of the affected facility for a period of two years following the date of such record in accordance with 40 CFR 60.48c(i).

The reporting period for the reports required under this subpart is each six-month period. All reports shall be submitted to the administrator and shall be postmarked by the 30th day of the following the end of the reporting period in accordance with 40 CFR 60.48c(j).

40 CFR 60, Subpart IIII .....Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

40 CFR 60.4200 .....Am I subject to this subpart?

High Desert Milk, Inc. is subject to 40 CFR 60, Subpart IIII because they are an owner operator of a compression ignition (CI) internal combustion engine (ICE) with a displacement of less than 30 liters per cylinder and the model year is 2007 or later and is not a fire pump engine as referenced in 40 CFR 60.4200(a)(1).

40 CFR 60.4201 .....What emission standards must I meet for non-emergency engines if I am a stationary CI internal combustion engine manufacturer?

These requirements do not apply to the facility because they will be operating emergency engines not manufacturing them.

40 CFR 60.4202 .....What emission standards must I meet for emergency engines if I am a stationary CI internal combustion engine manufacturer?

40 CFR 60.4202(a)(2) applies to this facility because they will be operating a compression ignition internal combustion engine for emergency purposes that is greater than 37kW. 40 CFR 60.4202(a)(2) is applicable by reference of 40 CFR 60.4205(b).

The permittee shall not discharge exhaust opacity from the compression-ignition (CI) nonroad engine to exceed 20 percent during acceleration mode, 15 percent during lugging mode, and 50 percent during the peaks in either the acceleration or lugging modes in accordance with 40 CFR 89.113 by reference of 40 CFR 60.4202(a)(2).

The permittee shall not exceed emission standards given in Table 5.3 in accordance with 40 CFR 89.112, Table 2, and as specified by manufacture specifications, by reference of 40 CFR 60.4202(a)(2). g/kW-hr was converted to lb/Hp-hr using the following conversion in Table 5.4.

Table 5.3 EMISSION STANDARDS

Rated Power (kW)	Tier	Model Year	NMHC+NO_x (g/kW-hr)	NMHC+NO_x (lb/Hp-hr)	CO (g/kW-hr)	CO (lb/Hp-hr)	PM (g/kW-hr)	PM (lb/Hp-hr)
kW>560	Tier 2	2006	6.4	0.0105	3.5	0.0057	0.20	3.28E-04

Eq. 5.1 CONVERSION PROCESS

$$\frac{g}{kW-hr}\times\frac{lb}{453.6g}\times\frac{kW-hr}{1.341hp-hr}=\frac{lb}{hp-hr}$$

The emission standards for 40 CFR 60, Subpart IIII are generally modeled after EPA's standards for nonroad and marine diesel engines (40 CFR 89.112 and 40 CFR 89.113) according to Federal Register Vol. 71, No. 132, 7/11/2006, Part II pg. 39156. The interpretation of this rule is that the emission standards of nonroad engines apply to the emergency generators as an NSPS affected sources not as a nonroad engine according to the definitions 40 CFR 1068.30 by reference of the Federal Register Vol. 71, No. 132, 7/11/2006, Part II pg. 39185, "An internal combustion engine is not a nonroad engine if the engine is regulated by a federal New Source Performance Standard promulgated under section 111 of the Act (42 U.S.C. 7411)."

40 CFR 60.4203 .....How long must I meet the emission standards if I am a stationary CI internal combustion engine manufacturer?

These requirements do not apply to the facility because they are not a stationary CI internal combustion engine manufacturer.

40 CFR 60.4204 .....What emission standards must I meet for non-emergency engines if I am an owner operator of a stationary CI internal combustion engine?

These requirements do not apply to this facility because they are operating engines for emergency use.

40 CFR 60.4205 .....What emission standards must I meet for emergency engines if I am an owner operator of a stationary CI internal combustion engine?

40 CFR 60.4205(b) applies to this facility because they will be operating a compression ignition internal combustion engines for emergency purposes that has a displacement of less than 30 liters per cylinder that is not a fire pump engine and are manufactured after April 1, 2006.

40 CFR 60.4206 .....How long must I meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?

40 CFR 60.4206 applies to this facility because they will operate a compression ignition internal combustion engine for emergency purposes that is greater than 37kW that meets the requirements of 40 CFR 60.4205(b). The permittee shall operate and maintain their CI ICE in accordance with the manufacturers written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

40 CFR 60.4207 .....What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this subpart?

40 CFR 60.4207(a) and (b) apply to this facility because they will operate a compression ignition internal combustion engine for emergency purposes that is greater than 37kW. Beginning October 1, 2007, the permittee shall use diesel fuel with a maximum sulfur content not to exceed 500 ppm and Cetane index of a minimum of 40 or a maximum aromatic content of 35 volume percent in accordance with 40 CFR 80.510(a) by reference of 40 CFR 60.4207(a). Beginning October 1, 2010, the permittee

shall use diesel fuel with a maximum sulfur content of 15 ppm maximum and a minimum of Cetane index of 40 or a maximum aromatic content of 35 volume percent in accordance with 40 CFR 80.510(b) by reference of 40 CFR 60.4207(b).

40 CFR 60.4208 .....What is the deadline for importing or installing stationary CI ICE produced in the previous year?

40 CFR 60.4208 applies to the facility because they will be installing CI ICE before December 31, 2008. However, the facility is prohibited to import stationary CI ICE with a displacement of less than 30 liters per cylinder that do not meet the applicable requirements specified in paragraphs (a) through (f) of section 40 CFR 60.4208 after the dates specified in paragraphs (a) through (f) of 40 CFR 60.4208. At the time of this permit action, the facility was assumed to install a Caterpillar (or equivalent) C32 ATAAC (or equivalent) engine.

40 CFR 60.4209 .....What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?

40 CFR 60.4209(a) applies to this facility as an owner and operator of a CI ICE. The permittee shall in stall a non-resettable hour meter prior to startup of the engine.

40 CFR 60.4210 .....What are my compliance requirements if I am a stationary CI internal combustion engine manufacturer?

These requirements do not apply to the facility because they are not a stationary CI internal combustion engine manufacturer.

40 CFR 60.4211 .....What are my compliance requirements if I am and owner operator of a stationary CI internal combustion engine?

40 CFR 60.4211(a), 40 CFR 60.4211(c), and 40 CFR 60.4211(e) apply to this facility because they will operate a CI ICE.

The permittee shall operate and maintain the stationary CI ICE and control device in accordance to the manufacturer’s written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer. In addition the owner and operator may only change those setting that are permitted by the manufacturer, permittee shall with all applicable provisions of 40 CFR 89, 94 and/or 1068 as they apply by reference of 40 CFR 60.4211(a).

The owner or operator of a 2007 model year and later stationary CI internal combustion engine and must comply with the emission standards specified in 40 CFR 60.4205(b), you must comply by purchasing an engine certified to the emission standards in 40 CFR 60.4205(b), for the same model year and maximum engine power; the engine must be installed and configured according to the manufacturer's specifications in accordance with 40 CFR 60.4211(c).

In accordance with 40 CFR 60.4211(e), emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. Anyone may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. For owners and operators of emergency engines meeting standards under 40 CFR 60.4205 but not 40 CFR 60.4204, any operation other than emergency operation, and maintenance and testing as permitted in this section, is prohibited.

40 CFR 60.4212 .....What test methods and other procedures must I use if I'm an owner or operator of a stationary CI internal combustion engine with a displacement of less than 30 liters per cylinder?

These requirements do not apply to this facility because they will not be installing pre-2007 CI ICEs and no applicable provisions of this subpart require or allow option of performance testing.

40 CFR 60.4213 .....What test methods and other procedures must I use if I am an owner or operator of a stationary CI ICE with a displacement of greater than or equal to 30 liters per cylinder?

40 CFR 60.4213 does not apply to the facility because they will be installing a CI ICE with a displacement of less than 30 liters per cylinder.

40 CFR 60.4214 .....What are my notifications, reporting, and recordkeeping requirements if I am and owner or operator of a stationary CI internal combustion engine?

40 CFR 60.4214(b) applies to this facility because the will operate a compression ignition internal combustion engine for emergency purposes. The owner or operator is not required to submit an initial notification. The owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.

40 CFR 60.4215 .....What requirements must I meet for engines used in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands?

These requirements do not apply to this facility because the facility is not located in the specified location(s).

40 CFR 60.4216 .....What requirements must I meet for engines used in Alaska?

These requirements do not apply to this facility because the facility is not located in the specified location(s).

40 CFR 60.4217 .....What requirements must I meet if I am an owner or operator of a stationary internal combustion engine using special fuels?

These requirements do not apply to this facility because they are combusting ASTM Grade 2 fuel oil.

40 CFR 60.4218 .....What part of the general provision apply to me?

All general provisions apply to this facility except those specified in 40 CFR 60, Subpart IIII.

40 CFR 60.4219 .....What definitions apply to this subpart?

All parts of this section apply to the requirements of 40 CFR 60, Subpart IIII.

5.5 Permit Conditions Review

SKIM MILK DRYER

Permit Condition 2.3

Permit Condition 2.3 establishes a PM_{10} emission limit for the skim milk dryers because the skim milk dryer baghouses are the largest contributors to the facility PM_{10} emissions, modeling demonstrates that the facility will operate (worse case normal) with PM_{10} emissions at 95% of the 24-hour NAAQS standard and 94% of the annual NAAQS standard. Compliance shall be demonstrated through Permit Conditions 2.6, 2.7, 2.8, 2.9, 2.10, General Provision 6, and General Provision 7.

Permit Condition 2.3 also establishes a CO emission limit for the skim milk dryer in. Compliance shall be demonstrated through Permit Condition 2.7, 2.10, 2.11, and General Provision 6 and 7.

Permit Condition 2.4
Permit Condition 2.4 establishes an opacity limit of 20% in accordance with IDAPA 58.01.01.625. Compliance shall be demonstrated through General Provision 7.

Permit Condition 2.5
Permit Condition 2.5 requires the permittee to develop and maintain an Operations and Maintenance manual for the baghouses to ensure capture efficiency for compliance with Permit Condition 2.3, compliance shall be demonstrated through General Provision 2.

Permit Condition 2.6
Permit Condition 2.6 requires the permittee to monitor the pressure drop across the baghouse with a pressure drop monitor and operate the pressure drop monitor in accordance with O&M Manual and the manufacturer's specification. Compliance shall be demonstrated through Permit Condition 2.9 and General Provision 7.

Permit Condition 2.7
Permit Condition 2.7 limits the through put of raw milk for processing in order to assure the PM_{10} emissions remain below the NAAQS thresholds and to keep the facility CO emissions at 98.5 T/yr below major threshold (of 100 T/yr), compliance shall be determined through 2.8, 2.9, 2.10 and General Provision 6.

NATURAL GAS BOILERS

Permit Condition 3.3
Permit Condition 3.3 establishes a CO emissions limit in order to manage the emissions to remain below major thresholds. Compliance shall be demonstrated through Permit Condition 3.7, 3.8 and General Provision 7.

Permit Condition 3.5
Permit Condition 3.5 established a PM grain loading limit in accordance with IDAPA 58.01.01.676.

Permit Condition 3.6
Permit Condition 3.6 establishes a fuel type limit in order to manage modeled criteria pollutant emissions. Compliance shall be demonstrated through permit condition 3.8 and General Provision 7.

Permit Condition 3.7
Permit Condition 3.7 establishes a natural gas fuel consumption limit in order to manage PM_{10} and CO emissions below major thresholds. Compliance shall be demonstrated through Permit Condition 3.8 and General Provision 7.

Permit Condition 3.9
Permit Condition 3.9 incorporates the applicable NSPS for a natural gas fired boiler.

FLUID-BED AND POWDER HANDLING

Permit Condition 4.3
Permit Condition 4.3 establishes an opacity limit of 20% in accordance with IDAPA 58.01.01.625. Compliance shall be demonstrated through General Provision 7.

Permit Condition 4.4
Permit Condition 4.4 requires the permittee to develop and maintain a Operations and Maintenance manual for the baghouses to ensure capture efficacy for compliance with Permit Condition 4.3, compliance shall be demonstrated through General Provision 2.

Permit Condition 4.5
Permit Condition 4.5 requires the permittee to monitor the pressure drop across the baghouse with a pressure drop monitor and operate the pressure drop monitor in accordance with O&M Manual and the manufacturer's specification. Compliance shall be demonstrated through Permit Condition 4.6 and General Provision 7.

EMERGENCY GENERATOR

Permit Condition 5.4, 5.7, 5.8, 5.10, and 5.11
Permit Condition 5.4, 5.7, 5.8, 5.10, and 5.11 incorporates 40 CFR 60, Subpart IIII - New Source Performance Standards (NSPS) for Compression Ignition Internal Combustion Engines. See Regulatory Review Section for details.

Permit Condition 5.5
Permit Condition 5.5 establishes fuel sulfur content for the emergency generators in accordance with IDAPA 58.01.01.728.02. Compliance shall be demonstrated through Permit Condition 5.6. Should there be a conflict between IDAPA and NSPS, NSPS shall govern.

Permit Condition 5.6
Permit Condition 5.6 establishes hours of operation for maintenance, this provision shall not apply during times of emergency use. Should there be a conflict between IDAPA and NSPS, NSPS shall govern.

Permit Condition 5.9
Permit Condition 5.9 requires the permittee to maintain distributor's fuel certification. Should there be a conflict between IDAPA and NSPS, NSPS shall govern.

6. PERMIT FEES

The applicant satisfied the PTC application fee requirement by submitting a fee of $1,000.00 at the time the original application was submitted, June 18, 2007. The total emissions from the proposed new non-major source are 100 T/yr or greater in accordance with IDAPA 58.01.01.225; therefore, the associated processing fee is $7,500.00. The applicant has satisfied the PTC processing fee requirement of IDAPA 58.01.01.226.01by submitting a fee of $7,500.00 received by DEQ on September 24, 2007.

Table 6.1 PTC PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	**Annual Emissions Increase (T/yr)**	**Annual Emissions Reduction (T/yr)**	**Annual Emissions Change (T/yr)**
NO_X	62.4	0	62.4
SO_2	0.5	0	0.5
CO	98.5	0	98.5
PM10	55.5	0	55.5
VOC	3.8	0	3.8
TAPS/HAPS	0.0	0	0.0
Total:		0	**220.7**
Fee Due	**$ 7,500.00**		

7. PERMIT REVIEW

7.1 Regional Review of Draft Permit

A draft permit was provided to Twin Falls Regional Office on September 12, 2007. Twin Falls regional office comments included typographical errors and a modification to the performance testing requirements to include a back half condition for condensables. These comments have been incorporated into this permit.

7.2 Facility Review of Draft Permit

A draft permit was provided to High Desert Milk on September 14, 2007 for review. Below is a list of the facility comments and permitting action:

- Can we change performance test requirement on the dryer from 180 days from issuance of the permit to 180 days from initial startup of the dryer, because construction of the dryer may not be completed in 180 days after permit issuance?
    - This comment has been incorporated. "Within 180 days after commencing operation of the skim milk dryer, the permittee shall conduct a performance test to measure PM_{10} emissions from the Skim Milk Dryer stacks, to demonstrate compliance with the PM_{10} emission limits in Permit Condition 2.3 and in accordance with General Provision 5 and 6."
- Emission estimates and modeling were performed assuming emissions from both boilers at once. The fuel consumption limits listed in the permit should also be on a per boiler basis. Do we really even need a fuel combustion limit since we did our emission estimates and modeling considering maximum uncontrolled operating conditions?
    - This comment has been incorporated. However, the purpose of the consumption/ combustion limit is to assure compliance with the emission limit of Permit Condition 3.3 and maintain CO emissions below major thresholds.
- Why is there a 1 hour limit per week on the maintenance hours of operation? I think it should be a 100 hour/yr limit for maintenance and a 500 hr/yr emergency operation.
    - This comment has been incorporated. "The operation of the emergency generator shall not exceed a maximum of 100 hour per year for maintenance checks in accordance with 40 CFR 60.4211(e). The generator is limited to a total of 500 hours per year including periods of electrical power outages."

7.3 Public Comment

An opportunity for public comment period on the PTC application was provided from August 7, 2007 to August 21, 2007 in accordance with IDAPA 58.01.01.209.01.c. During this time, there was a request for a public comment period on DEQ's proposed action.

A public comment period was conducted from **date** to **date**. During this time, there **WERE / WERE NOT** comments on the proposed action. A public hearing was conducted on **date** in **city**, Idaho. Response to comments received during the public comment period are provided in Appendix **X**.

8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommends that High Desert Milk, Inc. be issued a proposed PTC No. 2007.0100 for the construction and operation of a new milk processing facility. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

JP/sd Permit No. P-2007.0100

Appendix A – AIRS Information

P-2007.0100

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

Facility Name: **High Desert Milk, Inc.**
Facility Location: **Cassia County**
AIRS Number: **031-00034**

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO_2	B							U
NO_x	B		B					U
CO	SM		SM			X		U
PM_{10}	B		B					U
PT (Particulate)								
VOC	B							U
THAP (Total HAPs)								
			APPLICABLE SUBPART					
			Dc, IIII					

[a] **Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)**

[b] **AIRS/AFS Classification Codes:**

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or **each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.**

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

Appendix B – Emissions Inventory

P-2007.0100

4.0 Potential to Emit/Emission Estimates/Limitation on Potential to Emit

4.1 Emission Estimates

Emission estimates are summarized in Table 4-1. Specific discussion regarding potential to emit for each source is presented in the following sections.

4.1.1 Milk Drying

Particulate matter emission rates for the milk dryer (P101) were calculated based on information provided by the supplier, C/E/Rogers. Particulate capture efficiencies were considered for both the cyclones and baghouses when calculating emission rates. Emission rates for Carbon Monoxide (CO) and Nitrogen Oxides (NO_x) were obtained from Maxon Corporation, the manufacturer of the burner used to provide heat for the dryer. Sulfur Dioxide (SO_2), Volatile Organic Compound (VOC), and Toxic Air Pollutant emission rates were based on EPA AP-42, Chapter 1.4 "Natural Gas Combustion". Calculated emission rates for the dryer are included in Appendix 1.

4.1.2 Fluid-bed

Particulate emissions from the fluid-bed (P102) were calculated based on information provided by the supplier, C/E/Rogers. The particulate capture efficiency of the baghouse was considered when calculating the emission rate from this process unit. Calculated emission rates for the fluid-bed are included in Appendix 1.

4.1.2 Powder Handling

Particulate emissions from the powder silo loading (P103A and P103B) were calculated based on information provided by the supplier, C/E/Rogers. The particulate capture efficiency of the baghouses was considered when calculating the emission rate from this process unit. Calculated emission rates for the powder handling operations are included in Appendix 1.

4.1.4 Boilers

Emissions from the Boilers (P104 and 105) were estimated using AP-42 emission factors (AP-42, Chapter 1.4 "Natural Gas Combustion"). The two boilers will only combust natural gas. The estimated emissions should be considered worst case (by a factor of two) since the second boiler is only needed for backup purposes. Emission calculations are included in Appendix 1.

Table 4-1
Summary of Potential Emission Rates

Pollutant	Milk Dryer P101		Fluid-bed P102		Powder Storage P103		Boiler #1 P104		Boiler #2 P105		Total
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(ton/yr)
PM_{10}	10.6	46.2	1.1	4.7	0.1	0.5	0.5	2.0	0.5	2.0	55.5
SO_2	0.019	0.1					0.0	0.2	0.0	0.2	0.4
NO_x	1.5	6.4					6.2	27.0	6.2	27.0	60.3
CO	11.9	52.2					5.2	22.6	5.2	22.6	97.5
VOC	0.18	0.8					0.3	1.5	0.3	1.5	3.7
Lead	1.6E-05	0.0					0.0	0.0	0.0	0.0	0.0
Arsenic	6.4E-06	0.0					1.2E-05	0.0	1.2E-05	0.0	0.0
Cadmium	3.5E-05	0.0					6.8E-05	0.0	6.8E-05	0.0	0.0
Formaldehyde	2.4E-03	0.0					4.6E-03	0.0	4.6E-03	0.0	0.0
Nickel	6.7E-05	0.0					1.3E-04	0.0	1.3E-04	0.0	0.0

4.2 Process Weight Rule

The Process Weight Rule (IDAPA 58.01.01.700) applies to the milk processing operations at this plant. This rule limits the amount of particulate matter (PM) that can be discharged from a source. Appendix 1 includes an estimate of PM emissions from process equipment (excluding emissions from fuel combustion equipment) and summarizes the calculation of the allowable PM discharge according to the Process Weight Rule.

According to the Process Weight Rule analysis summarized in Appendix 1, the facility at its maximum capacity of 2.5 million pounds per day of raw milk is allowed to discharge 19.76 pounds PM per hour from process equipment (excludes fuel burning equipment). The facility is only anticipated to generate 11.5 pounds PM per hour; therefore, the anticipated PM loading from the facility will meet requirements of the process weight rule.

4.3 Limitations on Potential to Emit

No limits on potential to emit are required for this source. The only controls that must be maintained at the proposed facility are the baghouses that collect particulate from the drying, fluid-bed, and powder handling operations. The facility can operate at the maximum design capacity without exceeding NAAQS or triggering the major classification. The facility is considered a synthetic minor source since it relies on physical controls to prevent exceedance of the major source classification.

Criteria Air Pollutant Emissions
Skim Milk Dryer (P101)

Combustion Source Characteristics	
Dryer Manufacturer	Maxon
Burner Model	Crossfire Low NOx Line Burner
Input Heat Capacity (BTU/hr)	32,500,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	31,863
Annual Fuel Consumption (scf/yr)	279,117,647

Site Information	
Burley Barometric Pressure (mm Hg)	654.30

Stack Data [c]		
Stack ID	P101A	P101B
Stack Height (ft)	114	114
Stack Diameter (ft)	4.08	4.08
Exit Gas Temperature (°F)	190	190
Wet Actual Flow Rate (acfm)	44,042	44,042
Dry Standard Flow Rate (dscfm)	29,552	29,552
Stack Velocity (m/s)	17.08	17.08
Fd (dscf stack gas/BTU)	0.00871	
Grain Loading Flow Rate (dscfm)	6,398	
Baghouse Efficiency	92.00%	

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion + Process	See PM Calculation Sheet		10.553	46.2	1.33
SO_2	NG Combustion	0.6	$lb/10^6$ scf	0.019	0.1	0.0024
NO_x	NG Combustion + Process	0.0452	$lb/10^6$ BTU	1.468	6.4	0.185
CO	NG Combustion + Process	0.37	$lb/10^6$ BTU	11.918	52.2	1.502
VOC	NG Combustion	5.5	$lb/10^6$ scf	0.175	0.8	0.022
Lead	NG Combustion	0.0005	$lb/10^6$ scf	1.59E-05	0.0	2.01E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion + Process	See PM_{10}		10.553	46.2	1.33
Beryllium	NG Combustion	<1.2E-5	$lb/10^6$ scf	3.82E-07	0.0	4.82E-08
Mercury	NG Combustion	2.60E-04	$lb/10^6$ scf	8.28E-06	0.0	1.04E-06

PM Grain Loading Standard[b]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[b] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.242	0.004	0.015	yes

Notes:
(a) Emission factor for PM/PM10 estimated from baghouse particulate capture efficiency (see attached PM calculation sheet) and from natural gas fuel combustion emission factors AP-42 Chapter 1.4, "Natural Gas Combustion". NOx and CO emissions were estimated based on information provided by the vendor. The remaining pollutant emisssions were estimated using AP-42 emission factors for natural gas combustion (Chapter 1.4).
(b) IDAPA 58.01.01.677, computed for fuel combusting equipment only, excludes particulate emissions associated with the milk drying process.
(c) Emissions are routed through two cyclones and then two baghouses (in parallel) before final discharge. Listed emissions rates are combined emissions that are emitted through both stacks. For modeling purposes emissions were split in half between the two stacks for PM10 but all other pollutants were modeled at the full rate through each stack.

Toxic Air Pollutant Emissions
Skim Milk Dryer (P101)

Combustion Source Characteristics

Boiler Manufacturer	Maxon
Burner Model	Crossfire Low NOx Line Burner
Input Heat Capacity (BTU/hr)	32,500,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	31,863
Annual Fuel Consumption (scf/yr)	279,117,647

Toxic Air Pollutants

Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	6.37E-06	8.03E-07	1.50E-06
Barium	4.40E-03	lb/10^6 scf	1.40E-04	1.77E-05	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	6.69E-05	8.43E-06	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	3.82E-07	4.82E-08	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	3.82E-08	4.82E-09	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	3.50E-05	4.42E-06	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	4.46E-05	5.62E-06	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	2.68E-06	3.37E-07	3.30E-03
Copper	8.50E-04	lb/10^6 scf	2.71E-05	3.41E-06	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	3.82E-05	4.82E-06	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	8.92E-08	1.12E-08	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	2.39E-03	3.01E-04	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	5.74E-02	7.23E-03	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	1.21E-05	1.53E-06	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	8.28E-06	1.04E-06	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	3.50E-05	4.42E-06	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	1.94E-05	2.45E-06	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	6.69E-05	8.43E-06	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	8.28E-02	1.04E-02	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	7.65E-07	9.64E-08	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	1.08E-04	1.37E-05	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	7.33E-05	9.23E-06	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	9.24E-04	1.16E-04	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

Particulate Matter Emissions Analysis

Powder Handling Operations
High Desert Milk

	Output		Removal
	Average (lb/hr)	Maximum (lb/hr)	Efficiency
Dryer (to Cylones)	3,437	4,296	NA
Cyclone 1 (to Baghouse 1)	51.56	64.44	97.00%
Cyclone 2 (to Baghouse 2)	51.56	64.44	97.00%
P101A Dryer Baghouse 1 (to ambient)	4.12	5.16	92.00%
P101B Dryer Baghouse 2 (to ambient)	4.12	5.16	92.00%
Fluid-Bed (to Fluid-Bed Baghouse)	1,290	1,613	NA
P102 Fluid Bed Baghouse (to ambient)	0.8643	1.08	99.933%
Powder Handling (to Silo Baghouse)	5.6	7.0	NA
P103A and **P103B** Powder Silo Baghouse 1 and 2 (to ambient)	0.090	0.112	98.40%
Total (to ambient):	9.20	11.50	

Process Weight Rule (IDAPA 58.01.01.700)

$E=1.10 \times PW^{0.25}$

	Average	Maximum
PW (raw milk/day) =	2,000,000	2,500,000
PW (raw milk/hr) =	83,333	104,167
E (lb PM/hr) =	18.69	**19.76**

Criteria Air Pollutant Emissions
Fluid-Bed Baghouse (P102)

Combustion Source Characteristics	
Manufacturer	C/E/Rogers
Model	Fluid-Bed Baghouse
Baghouse Efficiency	99.93%

Stack Data	
Stack ID	P102
Stack Height (ft)	114.0
Stack Diameter (ft)	1.75
Exit Gas Temperature (°F)	130
Wet Actual Flow Rate (acfm)	7,950
Stack Velocity (m/s)	16.78

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	Process	See PM Calculation Sheet		1.080	4.7	0.14

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	Process	See PM_{10}		1.080	4.7	0.14

Notes:
(a) Emission factor for PM/PM10 estimated from baghouse particulate capture efficiency (see attached PM calculation sheet).

Criteria Air Pollutant Emissions
Powder Handling Baghouse (P103)

Combustion Source Characteristics	
Manufacturer	C/E/Rogers
Model	Powder Handling Baghouse
Baghouse Efficiency	98.40%

Stack Data[(b)]		
Stack ID	P103A	P103B
Stack Height (ft)	90.0	90.0
Stack Diameter (ft)	0.25	0.25
Exit Gas Temperature (°F)	80	80
Wet Actual Flow Rate (acfm)	650	650
Stack Velocity (m/s)	67.24	67.24
Discharge Orientation	horizontal w/ cap	

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	Process	See PM Calculation Sheet		0.112	0.5	0.01

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	Process	See PM_{10}		0.112	0.5	0.01

Notes:
(a) Emission factor for PM/PM10 estimated from baghouse particulate capture efficiency (see attached PM calculation sheet).

Criteria Air Pollutant Emissions
Boiler #1 (B104)

Combustion Source Characteristics	
Boiler Manufacturer	Superior Boiler Works, Inc.
Burner Model	Super Seminole 7500 (or Equivalent)
Input Heat Capacity (BTU/hr)	62,766,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	61,535
Annual Fuel Consumption (scf/yr)	539,049,176

Site Information	
Burley Barometric Pressure (mm Hg)	654.30

Stack Data	
Stack Height (ft)	38.0
Stack Diameter (ft)	4.00
Exit Gas Temperature (°F)	350
Wet Actual Flow Rate (acfm)	19,778
Wet Standard Flow Rate (wscfm)	11,099
Dry Standard Flow Rate (dscfm)	9,112
Grain Loading Flow Rate (dscfm)	12,357
Stack Velocity (m/s)	7.99
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	lb/10^6 scf	0.468	2.0	0.059
SO_2	NG Combustion	0.6	lb/10^6 scf	0.037	0.2	0.005
NO_x	NG Combustion	100	lb/10^6 scf	6.154	27.0	0.775
CO	NG Combustion	84	lb/10^6 scf	5.169	22.6	0.651
VOC	NG Combustion	5.5	lb/10^6 scf	0.338	1.5	0.043
Lead	NG Combustion	0.0005	lb/10^6 scf	3.08E-05	0.0	3.88E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.468	2.048	5.89E-02
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	7.38E-07	0.000	9.30E-08
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	1.60E-05	0.000	2.02E-06

PM Grain Loading Standard[b]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[b] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.468	0.004	0.015	yes

Notes:
(a) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion", unless otherwise noted.
(b) IDAPA 58.01.01.677

Toxic Air Pollutant Emissions
Boiler #1 (P104)

Combustion Source Characteristics	
Boiler Manufacturer	Superior Boiler Works, Inc.
Burner Model	Super Seminole 7500 (or Equivalent)
Input Heat Capacity (BTU/hr)	62,766,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	61,535
Annual Fuel Consumption (scf/yr)	539,049,176

Site Information	
Burley Barometric Pressure (mm Hg)	654.18

Stack Data	
Stack Height (ft)	38.0
Stack Diameter (ft)	4.00
Exit Gas Temperature (°F)	350
Wet Actual Flow Rate (acfm)	19,778
Wet Standard Flow Rate (wscfm)	11,099
Dry Standard Flow Rate (dscfm)	9,112
Grain Loading Flow Rate (dscfm)	12,357
Stack Velocity (m/s)	7.99
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants

Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	1.23E-05	1.55E-06	1.50E-06
Barium	4.40E-03	lb/10^6 scf	2.71E-04	3.41E-05	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	1.29E-04	1.63E-05	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	7.38E-07	9.30E-08	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	7.38E-08	9.30E-09	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	6.77E-05	8.53E-06	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	8.61E-05	1.09E-05	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	5.17E-06	6.51E-07	3.30E-03
Copper	8.50E-04	lb/10^6 scf	5.23E-05	6.59E-06	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	7.38E-05	9.30E-06	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	1.72E-07	2.17E-08	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	4.62E-03	5.82E-04	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	1.11E-01	1.40E-02	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	2.34E-05	2.95E-06	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	1.60E-05	2.02E-06	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	6.77E-05	8.53E-06	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	3.75E-05	4.73E-06	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	1.29E-04	1.63E-05	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	1.60E-01	2.02E-02	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	1.48E-06	1.86E-07	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	2.09E-04	2.64E-05	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	1.42E-04	1.78E-05	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	1.78E-03	2.25E-04	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

Criteria Air Pollutant Emissions
Boiler #2 (B105)

Combustion Source Characteristics

Boiler Manufacturer	Superior Boiler Works, Inc.
Burner Model	Super Seminole 7500 (or Equivalent)
Input Heat Capacity (BTU/hr)	62,766,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	61,535
Annual Fuel Consumption (scf/yr)	539,049,176

Site Information

Burley Barometric Pressure (mm Hg)	654.30

Stack Data

Stack Height (ft)	38.0
Stack Diameter (ft)	4.00
Exit Gas Temperature (°F)	350
Wet Actual Flow Rate (acfm)	19,778
Wet Standard Flow Rate (wscfm)	11,099
Dry Standard Flow Rate (dscfm)	9,112
Grain Loading Flow Rate (dscfm)	12,357
Stack Velocity (m/s)	7.99
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	lb/10^6 scf	0.468	2.0	0.059
SO_2	NG Combustion	0.6	lb/10^6 scf	0.037	0.2	0.005
NO_x	NG Combustion	100	lb/10^6 scf	6.154	27.0	0.775
CO	NG Combustion	84	lb/10^6 scf	5.169	22.6	0.651
VOC	NG Combustion	5.5	lb/10^6 scf	0.338	1.5	0.043
Lead	NG Combustion	0.0005	lb/10^6 scf	3.08E-05	0.0	3.88E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.468	2.048	5.89E-02
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	7.38E-07	0.000	9.30E-08
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	1.60E-05	0.000	2.02E-06

PM Grain Loading Standard[b]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[b] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.468	0.004	0.015	yes

Notes:
(a) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion", unless otherwise noted.
(b) IDAPA 58.01.01.677

Toxic Air Pollutant Emissions
Boiler #2 (P105)

Combustion Source Characteristics	
Boiler Manufacturer	Superior Boiler Works, Inc.
Burner Model	Super Seminole 7500 (or Equivalent)
Input Heat Capacity (BTU/hr)	62,766,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	61,535
Annual Fuel Consumption (scf/yr)	539,049,176

Site Information	
Burley Barometric Pressure (mm Hg)	654.18

Stack Data	
Stack Height (ft)	38.0
Stack Diameter (ft)	4.00
Exit Gas Temperature (°F)	350
Wet Actual Flow Rate (acfm)	19,778
Wet Standard Flow Rate (wscfm)	11,099
Dry Standard Flow Rate (dscfm)	9,112
Grain Loading Flow Rate (dscfm)	12,357
Stack Velocity (m/s)	7.99
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants					
Pollutant	Emission Factor[a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)
Arsenic	2.00E-04	lb/10^6 scf	1.23E-05	1.55E-06	1.50E-06
Barium	4.40E-03	lb/10^6 scf	2.71E-04	3.41E-05	3.30E-02
Benzene	2.10E-03	lb/10^6 scf	1.29E-04	1.63E-05	8.00E-04
Beryllium	<1.2E-5	lb/10^6 scf	7.38E-07	9.30E-08	2.80E-05
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	7.38E-08	9.30E-09	2.00E-06
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02
Cadmium	1.10E-03	lb/10^6 scf	6.77E-05	8.53E-06	3.70E-06
Chromium	1.40E-03	lb/10^6 scf	8.61E-05	1.09E-05	3.30E-02
Cobalt	8.40E-05	lb/10^6 scf	5.17E-06	6.51E-07	3.30E-03
Copper	8.50E-04	lb/10^6 scf	5.23E-05	6.59E-06	3.33E-01
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02
Dichlorobenzene	1.20E-03	lb/10^6 scf	7.38E-05	9.30E-06	2.00E+01
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Fluorene	2.80E-06	lb/10^6 scf	1.72E-07	2.17E-08	1.33E-01
Formaldehyde	7.50E-02	lb/10^6 scf	4.62E-03	5.82E-04	5.10E-04
Hexane	1.80E+00	lb/10^6 scf	1.11E-01	1.40E-02	1.20E+01
Manganese	3.80E-04	lb/10^6 scf	2.34E-05	2.95E-06	3.33E-01
Mercury	2.60E-04	lb/10^6 scf	1.60E-05	2.02E-06	3.00E-03
Molybdenum	1.10E-03	lb/10^6 scf	6.77E-05	8.53E-06	3.33E-01
Napthalene	6.10E-04	lb/10^6 scf	3.75E-05	4.73E-06	3.33E+00
Nickel	2.10E-03	lb/10^6 scf	1.29E-04	1.63E-05	2.70E-05
Pentane	2.60E+00	lb/10^6 scf	1.60E-01	2.02E-02	1.18E+02
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00
Selenium	<2.4E-5	lb/10^6 scf	1.48E-06	1.86E-07	1.30E-02
Toluene	3.40E-03	lb/10^6 scf	2.09E-04	2.64E-05	2.50E+01
Vanadium	2.30E-03	lb/10^6 scf	1.42E-04	1.78E-05	3.00E-03
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01
Zinc	2.90E-02	lb/10^6 scf	1.78E-03	2.25E-04	6.67E-01

Notes:
(a) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
(b) IDAPA 58.01.01.585 and 586
* FNA - Factor Not Available

Example Calculations – Boiler Emission Estimates

1. Wet Standard Stack Flow Rate = (Q_{ws}) = (Fw) (Input Heat Capacity of Boiler)

$$F_{w(Natural\ Gas)} = 0.01061\ wscf\ stack\ gas / BTU \quad (40\ CFR\ 60,\ App\ A,\ Meth.\ 19,\ Table\ 19-1)$$

For Boiler:

$$Q_{ws} = (0.01061\ wscf\ stack\ gas / BTU)\left(62{,}766{,}000\frac{BTU}{hr}\right)\left(\frac{1hr}{60\ \text{min}}\right) = 11{,}099\ \text{wscf/min}$$

2. Dry Standard Stack Flow Rate = (Q_{ds}) = (F_d) (Input Heat Capacity of Boiler)

$$F_d = (0.00871\ dscf / BTU) \quad (40\ CFR,\ App\ A,\ Meth 19,\ Table\ 19-1)$$

For Boiler:

$$Q_{ds} = (0.00871\ dscf / BTU)\left(62{,}766{,}000\frac{BTU}{hr}\right)\left(\frac{1hr}{60\ \text{min}}\right) = 9{,}112\ \text{dscf/min}$$

3. Dry Standard Stack Flow Rate Corrected

for 3% O_2 and Altitude = $(Q_{ds,O_2,AL}) = (Q_{ds})\left(\frac{20.9}{20.9-3}\right)\left(\frac{P_S}{P_A}\right)$

P_S = Standard Barometric Pressure = 760 mm Hg
P_A = Actual Barometric Pressure = 654.30 mm Hg (approximate barometric pressure for site)

For Boiler:

$$Q_{ds,O_2,AL} = (9{,}112\ dscf / \text{min})\left(\frac{20.9}{20.9-3}\right)\left(\frac{760\ mm\ Hg}{654.30\ mm\ Hg}\right) = 12{,}357\ \text{dscf/min}$$

4. Wet Actual Stack Flow Rate = $(Q_{wa}) = \left(Q_{ws}\right)\left(\frac{P_S}{P_A}\right)\left(\frac{T_A}{T_S}\right)$

T_S=Standard Temperature= 273.15 K
T_A=Actual Temperature= 449.82 K (Boiler stack gas)

For Boiler:

$$Q_{wa} = (11{,}099 wscf/\min)\left(\frac{760\,mm\,Hg}{654.30\,mm\,Hg}\right)\left(\frac{449.82K}{293.15K}\right) = 19{,}778 \text{ wscf/min}$$

5. Volume Fuel Combusted = (V_c) = (Product Consumption Rate)(Hours of Operation)

For Boiler:

$$V_C = \left(61{,}535\,\frac{scf}{hr}\right)(8{,}760\,hour) = 539\ x10^6\ scf$$

6. Potential Emissions

Potential Emission Rate of Contaminant = (M_x) = (EF)(fuel consumption rate)
EF = Emission Factor, provided by equipment vendor or from AP-42.

For Boiler:

$$M_{PM_{10}} = \left(7.6\,\frac{lb}{10^6\,scf}\right)\left(62{,}766{,}000\,\frac{BTU}{hr}\right) = 0.468\frac{lb}{hr} = 0.059\frac{g}{s}$$

$$= \frac{\left(0.468\frac{lb}{hr}\right)\left(24\frac{hr}{day}\right)\left(365\frac{day}{yr}\right)}{2000\frac{lb}{ton}} = 2.0\frac{ton}{yr}$$

7. Particulate Matter Grain Emission Rate =

$$\left(PM_g\right) = \left(M_{pm}\left[\frac{g}{s}\right]\right)\left(\frac{15.43grain}{1g}\right)\left(\frac{60S}{1\min}\right)$$

For Boiler:

$$PM_g\left(0.059\,\frac{g}{s}\right)\left(\frac{15.43grain}{1g}\right)\left(\frac{60s}{1\min}\right) = 54.62\,\frac{grain}{\min}$$

8. Grain Loading Concentration Corrected to 3% O_2 and Altitude (C_{pm}) = $\frac{PM_g}{Q_{ds,O_2,AL}}$

For Boiler:

$$C_{PM} = \frac{54.62 \frac{grain}{\min}}{12{,}357 \frac{dscf}{\min}} = 4 \; x \; 10^{-3} \frac{grain}{dscf}$$

Appendix C – Modeling Review

P-2007.0100

MEMORANDUM DRAFT

DATE: September 14, 2007

TO: Jonathan Pettit, Air Quality Permitting Analyst, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT NUMBER: P-2007.0100

SUBJECT: Modeling Review for the High Desert Milk, Inc. Permit to Construct Application for a new milk processing facility in Burley, Idaho

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1.0 Summary

High Desert Milk, Inc. (High Desert Milk) submitted a Permit to Construct (PTC) application for a new milk processing facility to be located in Burley, Idaho. Air quality analyses involving atmospheric dispersion modeling of emissions associated with operations of the facility were submitted to demonstrate that the modification would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 [Idaho Air Rules Section 203.02]). Millennium Science & Engineering, Inc. (MSE), High Desert Milk's consultant, conducted the submitted ambient air quality analyses. The original application was received by DEQ on June 18, 2007. Supplemental information was received by DEQ on August 13, 2007, and revised modeling analyses were later received by DEQ via email from MSE on September 13, 2007.

A technical review of the submitted air quality analyses was conducted by DEQ. The submitted modeling analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the proposed facility were below significant contribution levels (SCLs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
To demonstrate compliance with the PM10 NAAQS, emissions from the dryer were evenly distributed between Dryer Baghouse #1 (P101A) and Dryer Baghouse #2 (P101B)	Dryer Baghouse #1 and Dryer Baghouse #2 should each have a PM10 emissions limit of 5.28 lb/hr and 23 ton/yr.

2.0 BACKGROUND INFORMATION

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The High Desert Milk facility will be located in Burley, Idaho. The area is designated as attainment or

unclassifiable for all criteria pollutants.

2.1.2 Significant and Full NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the proposed facility exceed the significant contribution levels (SCLs) of Idaho Air Rules Section 90, then a full impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02. A full NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

1. TABLE 2. APPLICABLE REGULATORY LIMITS

2. POLLUTANT	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual[f]	1.0	50[g]	Maximum 1st highest[h]
	24-hour	5.0	150[i]	Maximum 6th highest[j]
$PM_{2.5}$	Annual	Not established	15	Use PM_{10} as surrogate
	24-hour	Not established	35	Use PM_{10} as surrogate
Carbon monoxide (CO)	8-hour	500	10,000[k]	Maximum 2nd highest[k]
	1-hour	2,000	40,000[k]	Maximum 2nd highest[k]
Sulfur Dioxide (SO_2)	Annual	1.0	80[g]	Maximum 1st highest[k]
	24-hour	5	365[k]	Maximum 2nd highest[h]
	3-hour	25	1,300[k]	Maximum 2nd highest[h]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[g]	Maximum 1st highest[h]
Lead (Pb)	Quarterly	NA	1.5[l]	Maximum 1st highest[h]

[a] Idaho Air Rules Section 006.90
[b] Micrograms per cubic meter
[c] Idaho Air Rules Section 577 for criteria pollutants
[d] The maximum 1st highest modeled value is always used for significant impact analysis
[e] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f] The annual PM_{10} standard was revoked in 2006. The standard is still listed because compliance with the annual $PM_{2.5}$ standard is demonstrated by a PM_{10} analysis that demonstrates compliance with the revoked PM_{10} standard.
[g] Never expected to be exceeded in any calendar year
[h] Concentration at any modeled receptor
[i] Never expected to be exceeded more than once in any calendar year
[j] Concentration at any modeled receptor when using five years of meteorological data
[k] Not to be exceeded more than once per year

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been developed. EPA has asserted through a policy memorandum that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. Although the PM_{10} annual standard was revoked in 2006, compliance with the revoked PM_{10} annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard.

2.1.3 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted*

in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.

Permit requirements for toxic air pollutants from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.

Per Section 210, if the emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

2.2 Background Concentrations

Background concentrations are used in the full NAAQS impact analyses to account for impacts from sources not explicitly modeled. Table 3 lists appropriate background concentrations for the location of the proposed facility. DEQ provided MSE the background concentration values.

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Default small town/suburban background concentrations were used for all criteria pollutants except PM_{10}. PM_{10} concentrations were based on monitoring data from Rupert, Idaho.

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

Table 3. BACKGROUND CONCENTRATIONS		
3. POLLUTANT	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	76
	Annual	27
Carbon monoxide (CO)	1-hour	10,200
	8-hour	3,400
Sulfur dioxide (SO_2)	3-hour	42
	24-hour	26
	Annual	8
Nitrogen dioxide (NO_2)	Annual	32
Lead (Pb)	Quarterly	0.08

a. Micrograms per cubic meter
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

4. 3.0 MODELING IMPACT ASSESSMENT

3.1 Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate compliance with applicable air quality standards.

3.1.1 Overview of Analyses

Table 4 provides a brief description of parameters used in the submitted modeling analyses.

Table 4. MODELING PARAMETERS		
Parameter	Description/Values	Documentation/Addition Description
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 07026
Meteorological data	Boise	Surface and upper air data from Boise, Idaho
Terrain	Considered	Receptor, building, and emissions source elevations were determined using Digital Elevation Model (DEM) files
Building downwash	Considered	The building profile input program (BPIP) was used
Receptor Grid	Grid 1	25-meter spacing along the property boundary out to 300 meters
	Grid 2	100-meter spacing out to about 4,000 meters

3.1.2 Modeling protocol and Methodology

The submitted air impact analyses were conducted by MSE. A modeling protocol was submitted to DEQ prior to the application. Modeling was generally conducted using methods and data presented in the protocol and the *State of Idaho Air Quality Modeling Guideline*.

3.1.3 Model Selection

Idaho Air Rules Section 202.02 require that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. EPA provided a 1-year transition period during which either ISCST3 or AERMOD could be used at the discretion of the permitting agency. AERMOD must be used for all air impact analyses, performed

in support of air quality permitting, conducted after November 2006.

AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer
- Improved plume rise and buoyancy calculations
- Improved treatment of terrain affects on dispersion
- New vertical profiles of wind, turbulence, and temperature

AERMOD was used in the submitted analyses and verification analyses conducted by DEQ.

3.1.4 Meteorological Data

Surface and upper air meteorological data for 1988 through 1992, collected in Boise, Idaho, were processed through AERMET. AERMET is the meteorological data preprocessor for AERMOD. These data were processed by DEQ and were provided to MSE by DEQ. DEQ requested MSE to add 20 percent to modeled results as a contingency to account for the potentially nonrepresentativeness of Boise meteorological data for conditions at Burley.

3.1.5 Terrain Effects

Terrain effects on dispersion were considered in the analyses. Receptor elevations were obtained by JBR using Digital Elevation Model (DEM) 7.5-minute files.

3.1.6 Facility Layout

The facility layout used in the modeling analyses, including the ambient air boundary, buildings, and emissions units, were checked against the proposed layout provided in the application. The layout used in the model was sufficiently representative of the proposed site layout.

3.1.7 Building Downwash

Downwash effects potentially caused by structures at the facility were accounted for in the dispersion modeling analyses. The Building Profile Input Program (BPIP) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for AERMOD.

3.1.8 Ambient Air Boundary

MSE used the facility's property boundary as the ambient air boundary. DEQ assumed reasonable measures will be taken by the facility to preclude public access to the property.

3.1.9 Receptor Network

Table 4 describes the receptor grid used in DEQ's refined analyses. The receptor grid met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ determined the receptor grid was adequate to reasonably resolve maximum modeled concentrations.

3.2 Emission Rates

High Desert Milk emissions rates used in the modeling analyses were equal to or somewhat greater than those presented in other sections of the permit application or the DEQ Statement of Basis.

3.2.1 Criteria Pollutant Emissions Rates

Table 5 provides MSE criteria pollutant emissions rates used in the modeling analyses for both long-term and short-term averaging periods. Emissions rates of SO_2 and lead were below DEQ established thresholds used to evaluate the need for a modeling analysis.

Total emissions of the dryer were conservatively modeled from both the Dryer Baghouse #1 and Dryer Baghouse #2 simultaneously, except for PM_{10}. PM_{10} emissions from the dryer were evenly distributed between the two baghouses. Each baghouse should have an emissions limit equal to the corresponding modeled rate.

Table 5. EMISSIONS RATES USED FOR FULL NAAQS IMPACT MODELING

Emissions Point	Description	Emissions Rates (lb/hr)		
		PM_{10}[a]	Carbon Monoxide	Oxides of Nitrogen
P101A	Dryer Baghouse #1	5.28	11.9	1.47
P101B	Dryer Baghouse #2	5.28	11.9	1.47
P102	Fluid-Bed Baghouse	1.08	0	0
P103A	Powder Handling Baghouse #1	0.112	0	0
P103B	Powder Handling Baghouse #2	0.112	0	0
P104	Boiler #1	0.468	5.17	6.15
P105	Boiler #2	0.468	5.17	6.15
GEN	Emergency Generator	0.246 (0.014[b])	4.30	0.45

[a] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[b] Value used for annual average modeling

3.2.2 TAP Emissions Rates

Table 6 lists applicable TAP emissions increases associated with the proposed facility. Emissions of TAPs not listed in Table 6 were below applicable screening emissions levels (ELs) and modeling was not required.

Table 6. EMISSIONS RATES USED FOR TAPS IMPACT MODELING

Emissions Point	Emissions Rates (lb/hr)				
	Benzene	Formaldehyde	Arsenic	Cadmium	Nickel
P101A	6.70E-5	2.39E-3	6.37E-6	3.50E-5	6.69E-5
P101B	6.70E-5	2.39E-3	6.37E-6	3.50E-5	6.69E-5
P102	0.0	0.0	0.0	0.0	0.0
P103A	0.0	0.0	0.0	0.0	0.0
P103B	0.0	0.0	0.0	0.0	0.0
P104	1.30E-4	4.62E-3	1.23E-5	6.77E-5	1.29E-4
P105	1.30E-4	4.62E-3	1.23E-5	6.77E-5	1.29E-4
GEN	6.30E-4	6.50E-5	0.0	0.0	0.0

3.3 Emission Release Parameters

Table 7 provides emissions release parameters for the submitted analyses including stack height, stack diameter, exhaust temperature, and exhaust velocity. Detailed documentation/justification of stack parameters was not provided with the application. The application was not determined incomplete for this deficiency because stack parameters using in the modeling analyses are within reasonably expected values for the type of source and the modeled results are well within allowable standards. Slight changes in stack parameters will not likely

substantially alter the modeling results.

Table 7. EMISSIONS RELEASE PARAMETERS					
Release Point /Location	*Source Type*	*Stack Height (m)[a]*	*Modeled Diameter (m)*	*Stack Gas Temp. (K)[b]*	*Stack Gas Flow Velocity (m/sec)[c]*
P101A	Point	34.7	1.2	361	17.08
P101B	Point	34.7	1.2	361	17.08
P102	Point	34.7	0.5	327	16.78
P103A	Point	27.4	0.001[d]	300	0.001[d]
P103B	Point	27.4	0.001[d]	300	0.001[d]
P104	Point	11.6	1.2	450	7.99
P105	Point	11.6	1.2	450	7.99
GEN	Point	1.8	0.3	700	24.19

[a]Meters
[b]Kelvin
[c]Meters per second
[d]Set at 0.001 to account for a horizontal release

3.4 Results for Significant and Full Impact Analyses

MSE elected to present results of the full impact analyses, presumably because results from the significant impact analyses were all above SCLs.

Results of the full NAAQS impact analyses are shown in Table 8. DEQ did not conduct verification analyses because no substantial errors in submitted emissions or modeling parameters were identified, and modeling output files verified results.

Table 8. RESULTS FOR FULL IMPACT ANALYSES						
Pollutant	**Averaging Period**	**Maximum Modeled Concentration[a] (µg/m³)[b]**	**Background Concentration (µg/m³)**	**Total Ambient Impact (µg/m³)**	**NAAQS[c] (µg/m³)**	**Percent of NAAQS**
PM_{10}[d]	24-hour	66.5[e]	76	142.5	150	95
	Annual	19.7	27	46.7	50	93
Carbon monoxide (CO)	1-hour	717[e]	10,200	10,917	40,000	27
	8-hour	324[e]	3,400	3,724	10,000	37
Nitrogen dioxide (NO_2)	Annual	41.2	32	73.2	100	73

[a]Includes a 20 percent contingency added to the result to account for greater uncertain associated with the use of nonrepresentative meteorological data
[b]Micrograms per cubic meter
[c]National ambient air quality standards
[d]Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[e]Maximum 2nd highest modeled concentration from each year modeled separately, using the highest value of the five years modeled

3.5 Results for TAPs Analyses

Compliance with TAP increments were demonstrated by modeling TAP emissions increases associated with the facility (those TAPs with emissions exceeding the ELs). Table 9 summarizes the submitted ambient TAP analyses. TAP impacts from increased emissions associated with the proposed new facility are all below applicable AACs/AACCs.

Table 11. RESULTS OF TAP ANALYSES				
TAP	**Averaging Period**	**Maximum Modeled Concentration[a] ($\mu g/m^3$)[b]**	**AAC/AACC[c] ($\mu g/m^3$)**	**Percent of AAC/AACC**
Arsenic	Annual	8.4E-5	2.3E-4	37
Benzene	Annual	4.7E-3	0.12	4
Cadmium	Annual	4.6E-4	5.6E-4	82
Formaldehyde	Annual	3.1E-2	0.077	40
Nickel	Annual	8.6E-4	4.2E-3	20

[a]Includes a 20 percent contingency added to the result to account for greater uncertain associated with the use of nonrepresentative meteorological data
[b]Micrograms per cubic meter
[c]Acceptable Ambient Concentration or Acceptable Ambient Concentration for a Carcinogen

5. 4.0 CONCLUSIONS

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.